

REMARKS

Favorable reconsideration and allowance of this application are requested.

1. Request for Continued Examination

As a procedural note, the present amendment is being filed concurrently with a formal Request for Continued Examination (RCE) under 37 CFR §1.114. Accordingly withdrawal of the "finality" of the June 3, 2009 Official Action is in order so as to allow entry and consideration of the amendments and remarks presented herewith.

2. Discussion of Amendments

By way of the amendment instructions above, pending independent claims 1 and 8 have been amended so as to clarify that the at least one branching agent is a mixture of a styrene-maleic anhydride (SMA) copolymer and a styrene-acrylonitrile (SAN) copolymer. Support for such a revision can be found throughout the originally filed specification, for example, at page 4, lines 22-26 and page 11, lines 8-12. Claims 2 and 3 have been canceled as redundant in view of the amendments made to claim 1.

Claims 18-26 are new and depend directly or indirectly from independent claim 1. Such new claims define various disclosed aspects of the claimed SMA/SAN mixture. Thus, claim 18 defines the mixture as further comprising low-density polyethylene as supported by page 11, line 8, while claim 19 requires that the SMA and SAN be miscible with one another as supported by page 5, lines 16-18. Claims 20-26 define various amounts of the MA and AN contents of the SMA and SAN copolymers, respectively and the relative amounts of the SMA and SAN copolymers present in the composition. Support for such claims can be found in the originally filed specification at page 4, lines 15-21 and 26-27 and page 5, lines 10-23.

Thus, upon entry of this amendment, claims 1, 5-8 and 10-26 will remain pending herein for consideration. As will become evident from the discussion which follows, all pending claims are in condition for allowance.

3. Response to Substantive Issues

Applicants submit that the presently pending claims are patentable over the art of record, including WO '558 (WO 0266558) and Joachimi et al (US 2003/0162900).

A. The Claimed Invention

The present invention as defined by the pending claims herein relates to a polyamide composition and process for making the same with the following components:

- a polyamide base composition;
- a black polyaniline derivative;
- a branching agent comprised of a SMA/SNA mixture; and
- carbon black.

The claimed polyamide compositions of the present invention having the components noted above exhibit improved rheological behavior. In this regard, the compositions of the invention show an increased melt viscosity at low shear rates and Non-Newtonian melt flow behavior. Non-Newtonian melt flow behavior can be expressed in shear-thinning ratio. Table 2 on page 15 (see Examples I-III) of the originally filed specification shows the improved melt viscosity at low shear rates, as well as the shear-thinning ratio.¹ Improving the rheological behavior is beneficial for several processes applied in the molding industry, as for example blow molding and injection molding, as well as welding.

¹ The results of Table 2 on page 15 are also graphically presented in Figure 1 (see the open squares, denoted by Ex-I to Ex-III).

B. The Examiner's Position

The Examiner acknowledges that component F1 of WO '558 is only used in an amount of 1 wt.%, but seems to assert that it would be "reasonably believed" that the individual components therein, including lubricants, carbon black and nigrosine, would be present in an amount of at least 0.1 wt.% each absent evidence of unusual or unexpected results. The Examiner thus concludes that it is statutorily "obvious" 35 USC §103(a) for a person of ordinary skill in this art to employ at least 0.1 wt.% of each of the carbon black and nigrosine materials as cited in WO '558 as well as chain branching additives as disclosed by Joachimi et al.²

C. The Claimed Invention is Statutorily Unobvious

Applicants submit that the invention as a whole is statutorily unobvious. In this regard, applicants note that the following evidentiary results have been observed and reported in the originally filed specification:

1. Adding a branching agent to polyamide is well-known and results in an increase of the melt viscosity at low shear rates and/or the shear thinning ratio (see Comparative Examples A-E (CEA through CEE, respectively) in Table 2 and Figure 1).
2. Adding nigrosine to a polyamide composition comprising a branching agent, leads to a much less pronounced effect of the branching agent (see Comparative Examples G, H and I (CEG, CEH and CEI, respectively) in Table 2 and Figure 1). The melt viscosity at low shear rate only increases

² It is noted that the Examiner has maintained her rejection based on Joachimi et al in combination with WO '558 in the final Official Action of June 3, 2009 "as per reasons of record." However, the only reason of record for combining Joachimi et al with WO '558 is expressed in the non-final Official Action dated October 10, 2008 as evidencing the art-recognized knowledge that "...parts made from similar-such polyamide compositions can be welded together as per Joachimi et al." (Page 6, paragraph 8, lines 9-10.) Thus for the purpose of this Amendment, it has been assumed that the Examiner's final rejection is based on the disclosure in Joachimi et al of difunctional or polyfunctional additives having a branching and/or polymer chain-extending action.

a relatively small amount even though the amount of the branching agent is doubled (i.e., 0.9 wt.% in CEG to 1.8 wt.% in CEI).

3. Adding carbon black to a polyamide composition comprising a branching agent has hardly any influence on the melt viscosity at low shear rates. If there is any influence at all, however, carbon black seems to lower the melt viscosity at low shear rates (see Comparative Example F (CEF) in Table 2 and Figure 1).
4. Combining the features according to the present invention, namely (a) a polyamide, (b) a branching agent comprised of a mixture of SMA/SNA, (c) carbon black and (d) nigrosine, surprisingly results in the restoration of the meaningful effect of the branching agent to increase the low shear melt viscosity (see Examples I-III in Table 2 and Figure 1), as compared with a similar composition not comprising carbon black. This attribute is most certainly not expected, as addition of carbon black to a polyamide composition comprising a branching agent exhibits only minimal influence (see point 3 above) and since a polyamide composition comprising polyamide, branching agent and nigrosine (point 2 above) has been demonstrated to have substantially less of an increase in low shear melt viscosity.

A person skilled in the art, would therefore not expect that carbon black would increase the low shear melt viscosity of a polyamide composition comprising a branching agent comprised of a mixture of SMA/SNA and nigrosine, as carbon black in a polyamide composition comprising a branching agent shows hardly any effect on the low shear melt viscosity and nigrosine alone in a polyamide composition comprising a branching agent is shown to decrease the effect of the branching agent.

This evidence provided by way of the originally filed specification thus clearly establishes the statutory non-obviousness of the presently claimed invention.

WO '558 does not relate at all to a polyamide composition in which the rheological behavior is modified, and it is silent about melt viscosity, shear thinning ratio or burst pressure. WO '558 also is completely silent regarding a combination of black polyaniline derivative, a branching agent and carbon black in a polyamide composition having these beneficial properties. A person skilled in the art, wishing to influence the rheological behavior of a polyamide composition, would therefore not consult WO '558 as it relates to a composition with other characteristics. Even if he would consult WO '558, however he would not arrive at the present invention, as WO '558 does not relate to chain branching agents in polyamides, nor relates to influencing the rheological behavior of a polyamide composition.

Joachimi relates to an impact-resistant modified polyamide molding composition with a higher melt viscosity and improved surface quality. As acknowledged by the applicants, a known method to increase the low shear viscosity and/or shear-thinning ratio of a polyamide composition is to add a branching agent that can react with the polyamide (see the specification on page 1, lines 29-34 of the pending application). However, in those compositions comprising a black polyaniline derivative, adding branching agents does **not** result in the desired modification of the rheological behavior. (See point 2 above and Comparative Examples G, H and I (CEG, CEH and CEI, respectively) in Table 2 as well as Figure 1).

It is true that a black polyaniline derivative, namely nigrosine, is listed in Joachimi in paragraph [0091]. Carbon black is listed in this paragraph as well. In the examples, however, only carbon black is employed (see paragraph [0104] of Joachimi). Joachimi nowhere describes a polyamide composition comprising **both** a black polyaniline derivative, carbon black and a branching agent, let alone that this combination of components leads to an improvement of the rheological properties of a polyamide composition. A person skilled in the art, wishing to influence the rheological behavior of a polyamide composition comprising a black polyaniline derivative, would therefore not arrive at the claimed invention as Joachimi does not relate to this kind of composition,

let alone that the addition of branching agent and carbon black results in an improved rheological behavior.

Moreover, none of the Examples of WO '558 employ a branching agent. Instead branching agents are mentioned merely as an optional additive (see page 6 line 17 of WO'558). The composition C1, which is a styrene maleimide does not have functional groups that can react with the functional groups of the polyamide, and as such is therefore not a branching agent.

A person of ordinary skill in the art would therefore not arrive at the presently claimed invention by consulting WO '558 alone or in combination with Joachimi et al. Specifically, applicants note that:

- a) there would be no reasonable expectation for success: no branching agent was used in WO'558, let alone in combination with a black polyaniline derivative and carbon black.
- b) it would not be obvious to try, as no specification of the rheological behavior was presented in WO '558, let alone that a combination of branching agent, black polyaniline derivative and carbon black would have an influence on rheological behavior. Joachimi et al describes branching agents, but not in specific combination with black polyaniline derivative and carbon black, let alone in the amounts as presently claimed. Instead, Joachimi et al mentions carbon black and nigrosine as possible colorants. However, nowhere is an explicit amount of such "colorants" stated, nor are carbon black and nigrosine components used together in a composition.
- c) Not all elements of the claims are clearly and unambiguously disclosed in WO '558 in combination with Joachimi et al.

On this latter point, it is noted that what is required by an analysis under 35 USC §103(a) is more than merely “cherry picking” words or phrases from one prior art reference and combining it with another. As the Supreme Court observed in *KSR International Co. v. Teleflex Inc.*:³

“...a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions,it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.”

(emphasis added)

When the applied prior art of record is analyzed properly according to the standards of *Graham v. John Deer Co.*⁴ it must be concluded that the presently claimed invention is patentably *unobvious*. Hence, reversal of the Examiner’s rejection of all pending claims under 35 USC §103(a) as allegedly obvious based on WO ‘558 in view of Joachimi et al is in order.

³ 550 U.S. 398, 82 USPQ2d 1385, 1396 (2007)

⁴ 383 U.S. 1, 148 USPQ 459 (1966).

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4. Conclusion.

For the reasons advanced, applicants suggest that the rejection advanced against the prior claims under 35 USC §103(a) must be withdrawn. Such favorable action is solicited.

5. Fee Authorization

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Account No. 14-1140.

Respectfully submitted,

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